CLAIMS:

What is claimed is:

1.   A method of transmitting data across a communication medium to a receiving side, the communication medium using a transmission implementation, the method comprising:

if data to be transmitted can be encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, and if the transmission implementation groups information into transmission quanta having equal numbers of bits and has the property that each transmission quantum can be reported on the receiving side as having been received correctly, or in which a transmission error is detected, then:

encoding the data to be transmitted, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to at least one less than the number of bits in the transmission quantum; and

transmitting the encoded data over the network to the receiving side.

2.   The method of claim 1, wherein the second subgroup contains padding bits that adapt the first subgroup and second subgroup to have a total number of bits required by the transmission quantum.

3.   The method of claim 2, wherein the second subgroup contains a control field, the control field located within the second subgroup such that the control field is followed by the padding bits.

4.   The method of claim 2, wherein the second subgroup contains a control field, the control field located within the second subgroup such that the padding bits are followed by the control field.

5. The method of claim 1, wherein the critical information is represented by a pair of identical bits, each of the identical bits separated by the second subgroup of bits.

6. The method of claim 1, wherein the critical information is represented by two pluralities of bits, the two pluralities of bits being identical to each other, the two pluralities separated by the second subgroup of bits.

7. A method of transmitting data across a communication medium to a receiving side, the communication medium using a transmission implementation, the method comprising:

if data to be transmitted can be encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, and if the transmission implementation groups information into transmission quanta having equal numbers of bits and has the property that each transmission quantum can be reported on the receiving side as having been received correctly, or in which a transmission error is detected, and if the groups of bits and the transmission quanta have sizes that are multiples of 2 and that a start of a transmission quantum always aligns with an even-encoded bit in a group of bits, then:

encoding the data to be transmitted, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to at least two less than the number of bits in the transmission quantum; and

transmitting the encoded data over the network to the receiving side.

8. The method of claim 7, wherein the second subgroup contains padding bits that adapt the first subgroup and second subgroup to have a total number of bits required by the transmission quantum.

9. The method of claim 7, wherein the second subgroup contains a control field, the control field located within the second subgroup such that the control field is followed by the padding bits.

10. The method of claim 9, wherein the second subgroup contains a control field, the control field located within the second subgroup such that the padding bits are followed by the control field.

11. The method of claim 7, wherein the critical information is represented by a pair of identical bits, each of the identical bits separated by the second subgroup of bits.

12. The method of claim 7, wherein the critical information is represented by two pluralities of bits, the two pluralities of bits being identical to each other, the two pluralities separated by the second subgroup of bits.

13. A method of processing data received over a communication medium, the method comprising:

receiving data encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, each group of bits associated with a symbol, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the critical information and separating the replicated,

critical information by a number of bits from the second subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is not in in-packet mode, then replace the symbol associated with the errored group of bits with a DATA_NULL symbol; and

if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is in in-packet mode, then accept the symbol associated with the errored group of bits as data.

14. A method of processing data received over a communication medium, the method comprising:

receiving data encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, each group of bits associated with a symbol and a symbol position, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

if more than one group are received in error, and the errored groups are associated with the same symbol position, then ignoring the symbol associated with the errored groups.

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15.　A method of processing data received over a communication medium, the method comprising:

receiving data encoded as groups of bits, each group having a first subgroup of critical information, a second subgroup of critical information, and a third subgroup of less critical information, each group of bits associated with a symbol and a symbol position, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the first and second groups of critical information and separating the first instances of the replicated first and second subgroups of critical information from the second instances of the replicated first and second subgroups of critical information by a number of bits from the third subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

reading at least one of the first and second instances of the first subgroup of critical information;

reading at least one of the first and second instances of the second subgroup of critical information; and

performing action based on at least one of the values of the first and second instances of the first subgroup and at least one of the values of the first and second instances of the second subgroup.

16.　The method of claim 15, wherein a group of bits received is received in error, and the action performed is the ignoring of the associated symbol.

17.　The method of claim 15, wherein a group of bits is received in error, and the action performed comprises:

verifying that the associated symbol is an invalid control symbol;

ignoring the associated symbol;

incrementing a counter, the counter indicating a number of received invalid symbols;

setting a transmission mode to in-packet if the control symbol is a DATA_PREFIX control symbol, a SPEEDa control symbol, or a SPEEDb control symbol; and

replacing the control symbol with a DATA_NULL control symbol if the control symbol is a DATA_END control symbol.

18.   The method of claim 17, wherein the control symbol is determined by reading at least some of the bits of the third subgroup of less critical information.

19.   The method of claim 15, wherein a group of bits is received in error, and the action performed comprises:

verifying that the associated symbol is an invalid control symbol;

ignoring the control symbol;

incrementing a counter, the counter indicating a number of received invalid symbols;

clearing an in-packet transmission mode if the control symbol is a DATA_PREFIX control symbol, a SPEEDa control symbol, a SPEEDb control symbol, or a DATA-END symbol.

20.   The method of claim 19, wherein the control symbol is determined by reading at least some of the bits of the third subgroup of less critical information.

21.   The method of claim 15, wherein a group of bits is received in error, and the action performed comprises ignoring the control symbol.

22.   The method of claim 21, wherein the action performed further comprises clearing an in-packet transmission mode.

23.   The method of claim 15, wherein a group of bits is received in error, and the action performed comprises accepting the symbol as an arbitration request.

24.   The method of claim 23, wherein the action performed further comprises clearing an in-packet transmission mode.

25.   A computer program product containing instructions, which, when executed, transmit data across a communication medium, by performing the acts of:

if data to be transmitted can be encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, and if the transmission implementation groups information into transmission quanta having equal numbers of bits and has the property that each transmission quantum can be reported on the receiving side as having been received correctly, or in which a transmission error is detected, then:

encoding the data to be transmitted, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to at least one less than the number of bits in the transmission quantum; and transmitting the encoded data over the network to the receiving side.

26.   A computer program product containing instructions which, when executed, process data received over a communication medium, by performing the acts of:

receiving data encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical

information, each group of bits associated with a symbol, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is not in in-packet mode, then replace the symbol associated with the errored group of bits with a DATA_NULL symbol; and

if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is in in-packet mode, then accept the symbol associated with the errored group of bits as data.

27. A computer program product containing instructions which, when executed, process data received over a communication medium, by performing the acts of:

receiving data encoded as groups of bits, each group having a first subgroup of critical information, a second subgroup of critical information, and a third subgroup of less critical information, each group of bits associated with a symbol and a symbol position, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the first and second groups of critical information and separating the first instances of the replicated first and second subgroups of critical

information from the second instances of the replicated first and second subgroups of critical information by a number of bits from the third subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

reading at least one of the first and second instances of the first subgroup of critical information;

reading at least one of the first and second instances of the second subgroup of critical information; and

performing action based on at least one of the values of the first and second instances of the first subgroup and at least one of the values of the first and second instances of the second subgroup.

25. A device for transmitting data across a communication medium, comprising:

means for determining if data to be transmitted can be encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, and if the transmission implementation groups information into transmission quanta having equal numbers of bits and has the property that each transmission quantum can be reported on the receiving side as having been received correctly, or in which a transmission error is detected; and

means for encoding the data to be transmitted, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to at least one less than the number of bits in the transmission quantum; and transmitting the encoded data over the network to the receiving side.

26. A device for processing data received over a communication medium, comprising:

means for receiving data encoded as groups of bits, each group having a first subgroup of critical information and a second subgroup of less critical information, each group of bits associated with a symbol, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the critical information and separating the replicated, critical information by a number of bits from the second subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

means for, if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is not in in-packet mode, replacing the symbol associated with the errored group of bits with a DATA_NULL symbol; and

means for, if an errored group of bits is received, and one of the replicated, critical information bits is evaluated to be of a first value, and transmission mode is in in-packet mode, accepting the symbol associated with the errored group of bits as data.

27.   A device for processing data received over a communications medium, comprising:

means for receiving data encoded as groups of bits, each group having a first subgroup of critical information, a second subgroup of critical information, and a third subgroup of less critical information, each group of bits associated with a symbol and a symbol position, wherein the groups of bits are received in transmission quanta having equal numbers of bits, the groups of bits and the transmission quanta having sizes that are multiples of 2 and a start of a transmission quantum is aligned with an even-encoded bit in a group of bits, the encoding replicating the first and second groups of critical information and

separating the first instances of the replicated first and second subgroups of critical information from the second instances of the replicated first and second subgroups of critical information by a number of bits from the third subgroup, the number of bits equal to no less than two less than the number of bits in the transmission quantum;

means for reading at least one of the first and second instances of the first subgroup of critical information;

means for reading at least one of the first and second instances of the second subgroup of critical information; and

means for performing action based on at least one of the values of the first and second instances of the first subgroup and at least one of the values of the first and second instances of the second subgroup.